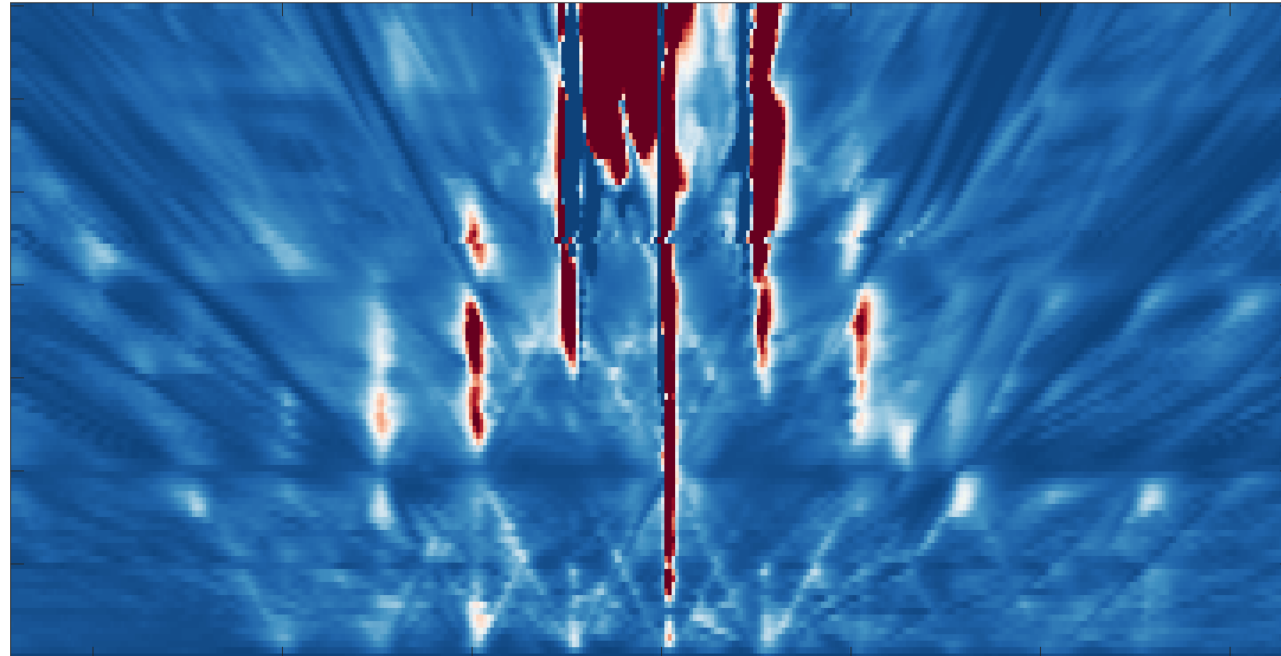


# Women in physics

## Career symposium



Mitali Banerjee

Tenure track Assistant Professor

**Laoratory of Quantum Physics: Topology and Correlations**

Swiss Physical Society Meeting 2023



# My Background

- Grew up in Kolkata (City of ~ 15 million)
- Books are my favorite (father's vast collection of books)
- My both grand-mothers, and my mother are exemplary women
- I loved going to my school (girls' only missionary convent)
- I loved physics the most almost as long as I can remember!
- I had extremely talented peers in my University
- I have met most of my favorite teachers in my University
- I don't recall ever feeling that I am a girl hence I am any less 😊

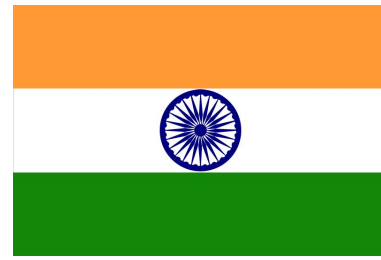
# More about me 😊

- I wanted to become a string theorist (But did Condensed Matter!)
- I started my Ph.D. in theory, got bored and started doing experiments
- I enjoy challenging myself over and over (like Harry Potter 😊)
- I still spend a lot of time reading works in other fields of physics

# Education

- B.Sc in Physics from Calcutta University
- M. Sc in Physics from Calcutta University
- Ph. D in Condensed Matter Physics from Jadavpur University
- 1st Postdoc at Indian Institute of Science, Bangalore, India
- 2nd Postdoc at Weizman Institute of Science, Rehovot, Israel
- Reseach Associate at Columbia University, New York, USA





# Ph.D projects

**Supervisors : Prof. Abhijit Mookerjee (Theory) and Prof. A. K. Majumdar (Experiment)**

- Theory of disordered magnetic alloys
- Frustrated magnetic states in doped permalloy
- Magnetic thin films of permalloys
- High temperature superconductivity (Theory: not included in thesis)

# Postdoc-1 projects: India



**Supervisors : Prof. Arindam Ghosh**

- Topological Insulators
- $1/f$  noise

**Changed field of research!!**



# Postdoc-2 projects: Israel

Supervisors : Prof. Moty Heiblum

- Quantum devices using semiconductor-superconductor interface
- Quantization heat flow for fractional charges
- Quantization heat flow for non-abelian quasiparticles (Majorana)

Again Changed field of research 😊

This time twice in the same Lab !

# Postdoc-2 projects

Supervisors : Prof. Moty Heiblum



## LETTER

---

---

[doi:10.1038/nature22052](https://doi.org/10.1038/nature22052)

### Observed quantization of anyonic heat flow

Mitali Banerjee<sup>1</sup>, Moty Heiblum<sup>1</sup>, Amir Rosenblatt<sup>1</sup>, Yuval Oreg<sup>1</sup>, Dima E. Feldman<sup>2</sup>, Ady Stern<sup>1</sup> & Vladimir Umansky<sup>1</sup>

**Two very important works!**

## ARTICLE

---

---

<https://doi.org/10.1038/s41586-018-0184-1>

### Observation of half-integer thermal Hall conductance

Mitali Banerjee<sup>1</sup>, Moty Heiblum<sup>1\*</sup>, Vladimir Umansky<sup>1</sup>, Dima E. Feldman<sup>2</sup>, Yuval Oreg<sup>1</sup> & Ady Stern<sup>1</sup>





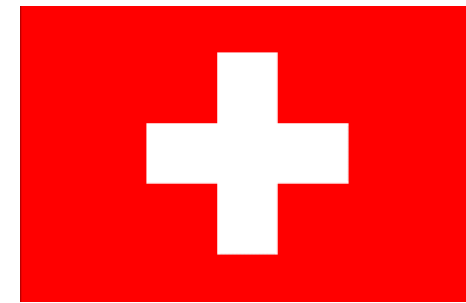
# Research Associate projects: USA

**Supervisors : Prof. Cory R. Dean**

- Graphene-NbSe<sub>2</sub> junctions
- Twisted bi-layer graphene

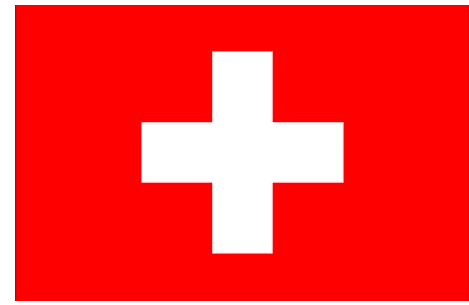
**Changed field of research!!**

# My team at EPFL



Swiss Physical Society Meeting 2023

# Tenure track Asst. Professor



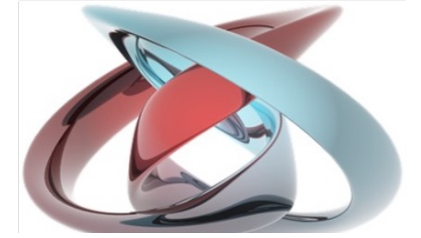
- I have my own team of students
- I choose my research projects more independently
- I teach every year: Quantum Mechanics I to BA4 Physics students  
Quantum Transport in mesoscopic systems to MA2
- I take part in professional and administrative activities

# Current funding

- SNSF Eccellenza grant
- QuantERA consortium grant
- EPFL



# Current projects



- Strongly correlated states in twisted graphene moiré systems
- Superconductivity in twisted graphene moiré systems
- Quantum Hall interferometry in graphene
- Heat transport in GaAs

# Observation of Giant Correlation-enhanced Valley Splitting in a Flat-band Moire Superlattice



Jin Jiang, 3rd year

05/09/2023 at 14:30

# Unconventional Superconductivity in Twisted Trilayer Graphene



Zekang Zhou, 2nd year

05/09/2023 at 15:30

# Fabry-Perot interferometer in bi-layer graphene



Mario Di Luca, 1st year

05/09/2023 at 16:00



# What is next?

- Reaching all the milestones from current projects that are funded
- Starting a couple of new projects to test the new grounds
- Getting my tenure at EPFL
- Become a significant contributor to my field of research

# Looking back

Is there anything I could have done differently?

# Final words

- Don't try to squeeze into a glass slipper. Instead, shatter the glass ceiling!
- You can be smart and tough and at the same time not lose your femininity!
- I think it's great to be flawed. I am hugely flawed, and I like it this way ☺
- You fall, you make mistakes and learn from them, be a human and be YOU!

**Thank you for listening!**

**EPFL**

Laboratory of Quantum Physics:  
Topology and Correlations

